REMARKS

At the issuance of the outstanding Office Action claims 1-18 were pending in the application. The claims are not amended by this Response.

Claims 1-18 stand rejected under 35 USC§103. More specifically claims 1, 3-5, 7-15 and 16-18 stand rejected under 35 USC§103(a) as being unpatentable over Fragelli (US 6103101). Claims 4 and 16-18 stand rejected under 35 USC§103(a) as being unpatentable over Fragelli in view of Baker (US 5951848). Claim 6 stands rejected under 35 USC§103(a) as being unpatentable over Fragelli in view of Miller (US 4657661). Applicants respectfully traverse these rejections for at least the following reasons.

The present invention relates to a process for producing a stable lubricant bright stock, a lubricating oil of high viscosity obtained from residues of petroleum distillation by dewaxing. The feed to the process is a petroleum residuum-derived stream having designated contents of sulfur and nitrogen. In the process according to the invention, the residuum-derived stream undergoes a deep cut distillation at a cut point in the range of 1150° F to 1300° F to produce a heavy fraction and at least one light fraction. The light fraction is hydrocracked under lube hydrocracking conditions and at least a portion of the hydrocracked stream is contacted with a hydroisomerization catalyst and hydrogen under hydroisomerization conditions to produce the lubricant bright stock.

In this invention, the objective is to make a low haze bright stock via catalytic hydroisomerization. This is accomplished by taking a waxy vacuum residuum (e.g. from a hydrocracked DAO) and doing a deep cut distillation, such as by a wiped film evaporator, to give a light vacuum resid fraction and a heavy vacuum

resid fraction. The light vacuum resid fraction is then hydrotreated/hydrocracked to reduce sulfur and nitrogen content, and then hydroisomerized to a low pour, low cloud point (low haze) bright stock. By removing the very heavy end (e.g. 1200 °F+) from the vacuum residuum feed to the hydrotreater and hydroisomerizer, the instant process makes it possible to get a low cloud point in the hydroisomerization stage while still getting a high enough viscosity for a bright stock. This works because the most difficult to convert haze molecules (and most difficult to convert S and N molecules) are in the heavy vacuum residuum (e.g. 1200 °F+) fraction, which is removed from in the process by the deep cut distillation according to the invention and is not sent to the hydrotreater and hydroisomerizer.

By contrast, Fragelli hydrotreats a full boiling feed then distills at various cut points. This includes a cut point of 545 °C by vacuum distillation. He then solvent dewaxes the 545 °C+ bottoms to give a bright stock. Note that Fragelli does not solve the problem of making a low haze catalytically isomerized oil, and instead avoids doing any catalytic isomerization on the 545 °C+ bottoms to begin with. Fragelli further fails to recognize that by cutting the back end off the 545 °C+ by deep cut distillation (e.g. at 650 °C (1200 °F)) such as by wiped film evaporator, the light end could then be hydrotreated and hydroisomerized to a low haze bright stock. Fragelli fails to recognize this because he does not recognize in the first place that the hardest to convert haze molecules and hardest to convert S and N molecules are in the heavy vacuum resid fraction, and so he instead sends this fraction (i.e. the whole 545 °C+) through his process rather than removing it.

The outstanding Office Action confuses Fragelli's 545 °C cut by vacuum distillation with the deep cut distillation of the present invention, e.g. by wiped film

evaporator, where the instant deep cut distillation is a separate step, in addition to, the first vacuum distillation. In effect, the process described by Fragelli uses the whole vacuum residuum while the instant process uses only the light part of the same vacuum residuum. It's this second, much deeper cut, with removal of the bottoms from that much deeper cut, which is at the heart of the invention. This is what allows the process to produce a low haze bright stock, which was not previously achievable.

So, as described above, it is not merely a matter of changing the order of process steps in which the instant process differs from that disclosed by Fragelli as the outstanding Office Action asserts.

The outstanding Office Action relies on the Baker reference in support of a rejection of claims 4 and 16-18 for its disclosure of a feed stock derived from a hydrocracked crude oil residuum with a concentration of sulfur of 7 ppm and a concentration of nitrogen less than .5 ppm. Although the Baker reference discusses hydrocracking crude oil residua, it does not teach making a bright stock. Also, it does not teach distilling the residua at 1150° F - 1300° F in bright stock manufacturing. Finally, even assuming for the sake of argument that it would have been obvious to modify the process of Fragelli to include a feed stock derived from the hydrocracked crude oil residuum as disclosed by Baker, the combination would neither disclose nor suggest the present invention in light of the deficiencies of the Fragelli reference pointed out above.

Likewise, the rejection of claim 6 is based on the Fragelli reference. In light of the prior discussion of that reference, Applicants respectfully traverse the rejection of claim 2.

In summary, the cited references neither disclose nor suggest a process for making a lubricant bright stock from a residuum-derived feed having designated levels of sulfur and nitrogen from which a very heavy fraction is removed by a deep cut distillation and in which a heavy oil is dewaxed under hydroisomerization conditions.

In light of the foregoing, applicants respectfully request a favorable reconsideration of the outstanding Office Action and an early Notice of Allowance.

Respectfully submitted,

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